

**WE CLAIM AS OUR INVENTION:**

1. An acoustic gas analyzer comprising:  
an acoustic velocity meter disposed and adapted to interact with a gas to be analyzed by emitting acoustic energy into the gas and detecting said acoustic energy after transmission through the gas, said acoustic velocity meter emitting a first output dependent on the detected transmission of the acoustic energy through the gas;  
a temperature probe, having a probe time constant, disposed and adapted to interact with the gas to measure a temperature of the gas, and emitting a second output indicative of the measured temperature of the gas;  
a signal processor supplied with said first output for producing, from said first output, a temporally-adapted first output dependent on the probe time constant; and  
a calculation unit supplied with said temporally adapted first output and with said second output for determining compositional information of the gas from said temporally-adapted first output and said second output.
2. An acoustic gas analyzer as claimed in claim 1 wherein said first output has an amplitude, and wherein said signal processor comprises a filter arrangement supplied with said first output for producing a time-dependent variation of the amplitude of the first output, dependent on said probe time constant, to produce said temporally-adapted first output.
3. An acoustic gas analyzer as claimed in claim 2 wherein said filter arrangement comprises a recursive filter having a filter constant that is substantially equal to the probe time constant.

4. An acoustic gas analyzer as claimed in claim 3 wherein said recursive filter is a digital filter.